1 Short answer questions

1. (Def: subset, power set) Compute the power set of \(\{a, b\}\).

2. (Def: ordered pair, ordered \(n\)-tuple, Cartesian products and powers) Give an example of a proper subset of \(S = \{1, 2\} \times \{a, b\}\) that is itself a Cartesian product, and write it as a product. (Note: ‘proper subset’ means not the whole set \(S\).)

3. (Def: set builder notation) Write out the elements of the following sets

(a) \(\{x \in \mathbb{Z} : x < 0 \text{ and } x = 1\}\)

(b) \(\{x + 1 : 2 < x < 5, x \in \mathbb{Z}\}\)

4. (Def: set, element, equality of sets, empty set, cardinality of set) Give an example of a single set \(S\) which satisfies the following properties, all at once:

- \(|S| = 4\)
- \(\emptyset \in S\)
- \(\{a, b\} \subset S\)